

Fall 2023

Early Identification of Barriers to Medication Adherence in the Elderly Population Through the Use of a Modified Screening Tool

Miranda Joyner

Blake Meranto

Follow this and additional works at: https://aquila.usm.edu/dnp_capstone



Part of the [Family Practice Nursing Commons](#), and the [Geriatric Nursing Commons](#)

Recommended Citation

Joyner, Miranda and Meranto, Blake, "Early Identification of Barriers to Medication Adherence in the Elderly Population Through the Use of a Modified Screening Tool" (2023). *Doctoral Projects*. 246.
https://aquila.usm.edu/dnp_capstone/246

This Dissertation/Thesis is brought to you for free and open access by The Aquila Digital Community. It has been accepted for inclusion in Doctoral Projects by an authorized administrator of The Aquila Digital Community. For more information, please contact aquilastaff@usm.edu.

EARLY IDENTIFICATION OF BARRIERS TO MEDICATION ADHERENCE
IN THE ELDERLY POPULATION THROUGH THE USE OF
A MODIFIED SCREENING TOOL

by

Miranda Arleen Joyner and Blake Myles Meranto

A Doctoral Project
Submitted to the Graduate School,
the College of Nursing and Health Professions
and the School of Leadership and Advanced Nursing Practice
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Nursing Practice

Committee:

Dr. Lisa Morgan, Committee Chair
Dr. Carolyn Coleman

December 2023

COPYRIGHT BY

Miranda Arleen Joyner and Blake Myles Meranto

2023

Published by the Graduate School



ABSTRACT

Medication nonadherence (MNA) is a major contributor to hospitalizations and accounts for billions of dollars spent every year on health care. Despite medications being prescribed in nearly 75% of healthcare interactions, it is estimated that 33 to 50% of Americans do not take their medications as prescribed, if at all (Bartlett Ellis et al., 2020; Kleinsinger, 2018). The COM-B (Capability, Opportunity, Motivation, Behavior) Model used in this DNP project suggests that an individual must have the capability, opportunity, and motivation to enact a certain behavior, and should any of these areas be lacking, the behavior is unlikely to occur. This DNP project focused on these influential factors in the form of social determinants of health (SDH) with the affected behavior being compliance with one's medication regimen. The purpose of this DNP project was to implement a survey to identify the most prevalent factors that negatively affect medication compliance in individuals ages 65 and over. The main barrier noted from this DNP project was forgetfulness with no notable difference in capability, opportunity, or motivation. Not only did this survey have the potential to alert patients of their potentially detrimental practices, but it also aided providers in understanding and addressing their local patient population's struggles with taking medications.

ACKNOWLEDGMENTS

We offer our sincere gratitude and respect to our committee chair, Dr. Lisa Morgan, for her persistent patience and kindness since the beginning of this program. Dr. Morgan's guidance helped us to weave through the complexities of this DNP project while also assuring us of our capabilities. Regardless of the plethora of correspondences and meetings that we have had with her, Dr. Morgan remained attentive and composed, and for that, we are ever grateful. We would also like to thank the instructors that we have had throughout this program for their time and support to help us reach this point.

DEDICATION

I would like to dedicate this DNP project to my parents, Keith and Andrea Meranto, and my husband, Riley Katzer, for their never-ending love and support. It is because of their motivation that I became confident enough to pursue this graduate degree in the first place. As this academic journey nears its end, I know that I would not have been able to persevere through the obstacles that I have faced without them. - *Blake Meranto*

I would like to dedicate this DNP project to my husband Raymond, who has supported and motivated me throughout my graduate career, my grandmother Ruth Bellman who was the inspiration for this DNP project, and my daughters Jayden and Sadie for being so understanding and supportive while I took time from being a mom to achieve my goals. I love you all. Lastly, I have to thank my partner Blake for not only helping make this DNP project come to life, but for being the best confidant I could hope for during this program. – *Miranda Joyner*

TABLE OF CONTENTS

ABSTRACT ii

ACKNOWLEDGMENTS iii

DEDICATION iv

LIST OF TABLES viii

LIST OF ILLUSTRATIONS ix

LIST OF ABBREVIATIONS x

CHAPTER I – BACKGROUND 1

 Social Determinants of Health and Aging 1

 Costs 1

 Education 2

 Social and Community Context 3

 Medication Nonadherence (MNA) 4

 Aging Population 5

 Needs Assessment 5

 Available Knowledge 6

 National and State Data 6

 Regional Data 7

 Synthesis of Evidence 8

 Medication-Related Factors 8

Healthcare Provider-Related Factors	9
Patient-Related Factors	9
Healthcare System-Related Factors	10
Rationale	11
Survey Tool.....	11
COM-B Model	11
Conceptual Framework.....	13
Project Purpose	14
Doctor of Nursing Practice Essentials	15
Summary	16
CHAPTER II – METHODS	17
Project Description.....	17
Procedures.....	18
Pre-Intervention	18
Intervention	18
Post-Intervention.....	19
Ethical Considerations	20
Summary	20
CHAPTER III – RESULTS	21
Hattiesburg, Mississippi Urgent Care Sample Demographics.....	21

Ocean Springs, Mississippi Primary Care Clinic Sample Demographics	22
Analysis of the Data.....	24
Summary	28
CHAPTER IV – DISCUSSION.....	30
Summary.....	30
Interpretation of Results.....	30
Limitations	31
Conclusion	32
APPENDIX A – Medication Adherence Screen Tool	34
APPENDIX B – Medication Adherence Screen Tool Key.....	35
APPENDIX C – Medication Adherence Project Patient Consent Form.....	36
APPENDIX D – Institutional Review Board Notice of Committee Action	37
APPENDIX E – DNP Essentials.....	38
REFERENCES	41

LIST OF TABLES

Table 1 Hattiesburg, Mississippi Urgent Care Survey Demographics	23
Table 2 Ocean Springs, Mississippi Primary Care Survey Demographics.....	24
Table 3 Survey Frequencies and Percentages	26
Table 4 Capability, Opportunity, and Motivation Barrier Frequencies and Percentages .	28

LIST OF ILLUSTRATIONS

Figure 1. Conceptual Framework for Medication Adherence Factors. 14

LIST OF ABBREVIATIONS

<i>BMQ</i>	Brief Medication Questionnaire
<i>COM-B</i>	Capability, Opportunity, Motivation - Behavior Model
<i>DNP</i>	Doctor of Nursing Practice
<i>GED</i>	General Educational Development
<i>IRB</i>	Institutional Review Board
<i>MMAS</i>	Morisky Medication Adherence Scale
<i>MNA</i>	Medication Non-Adherence
<i>NCOA</i>	National Council on Aging
<i>SDH</i>	Social Determinants of Health
<i>U.S.</i>	United States
<i>USM</i>	The University of Southern Mississippi

CHAPTER I – BACKGROUND

Every year, MNA, also referred to as medication noncompliance, burdens the healthcare system. In the United States (U.S.), it accounts for approximately 290 billion dollars in healthcare costs annually and is related to a higher rate of national hospital admissions and disease exacerbations. MNA has been shown to detrimentally influence morbidity and mortality rates as well as the need for long-term care (Rosenthal & Burcham, 2021). Far too often, lack of compliance is not noted until after an adverse outcome has occurred partially due to providers not routinely asking about barriers that may influence full adherence. Providers may consider barriers such as insurance coverage before prescribing medication, however, other barriers such as complex medication schedules, available transportation to the pharmacy, or patient forgetfulness are less often addressed (PAN Foundation, 2020).

Social Determinants of Health and Aging

MNA is a common issue throughout the United States with the elderly population being at an increased risk due to natural consequences of aging and altered social determinants of health (SDH). Some of the most impactful SDH regarding MNA include economic stability, access to health care, and community support. Lifelong treatments consisting of complex medication regimens, polypharmacy, and common aspects of aging can negatively interact with one's social determinants of health and inhibit medication adherence.

Costs

Whether on an individual or a systematic level, MNA is more costly than it may appear. As the number of an individual's daily medications increases as a result of

managing chronic conditions, so too do recurrent healthcare costs. In 2020, 33% of Mississippians skipped a medication dose, cut pills in half, or avoided filling medication prescriptions altogether due to cost (Altarum Healthcare Value Hub [AHVH], 2020). While most American citizens aged 65 and over are eligible for Medicare, prescription drug coverage may not be covered unless a person's financial situation allows for added coverage such as Medicare Part D (American Association of Retired Persons [AARP], 2023). Individuals experiencing economic instability, especially those with food or housing insecurity, were shown to have an increased risk of MNA due to the prioritization of basic needs over health. Should medications take precedence over food, more problems may arise since some medications have adverse effects when taken without food (Wilder et al., 2021). With MNA comes a higher risk of disease exacerbations, increasing clinic and hospital visits (Shruthi et al., 2016). Frequent disease exacerbations potentially result in patients and caregivers losing wages to accommodate medical visits, and the healthcare system as a whole must often defray the exorbitant costs of preventable expenses.

Education

Education for the elderly can be challenging, yet it is imperative for positive outcomes. Discussions should include essential details such as generic and brand names of medication, dosage, frequency, purpose, and common and severe adverse effects. Additional education should include how to take the medication (i.e., with or without food), how to store it, when to stop taking it, and when to seek emergency medical attention. In this population, time constraints at visits, massive quantities of information, polypharmacy, and mental decline compound causing increased confusion surrounding

medication regimens and further instigating MNA. While some providers may supply written education for each medication, this tool may be unhelpful should the patient have a low educational level. A study by Bandi et al. (2017) noted that individuals 60 years of age or older showed a direct correlation between increased medication compliance and higher education level. To give patients the attention and information that they deserve, providers may use educational, medication-specific videos. However, even well-educated individuals who remember details about their medications is subject to forgetfulness as they age, which may hinder medication adherence (Shruthi et al., 2016).

Social and Community Context

Because of the increased risk of physical and mental decline associated with aging, along with the complexity of polypharmacy, elderly individuals can often benefit from a strong social support network. According to Wilder et al. (2021), individuals who have poor social support are less likely to take medications as directed while also being more likely to inherit a chronic disease. A supportive social network can aid patients by reminding them when to take medications or preparing the regimen so that the patient does not have to struggle with reading labels or opening bottles. Having a support system also provides the patient with comfort and reassurance while also reducing the negative effects of the ailment and treatment (Gerlach et al., 2017). Caregivers can remove a barrier to adherence by assisting the patient in obtaining medication from a pharmacy and reinforcing the importance of medication adherence.

Just as social support can strengthen medication adherence, noncompliance can impair relationships with one's social network and community. When a patient does not adhere to their prescribed medications, disease exacerbations are more likely. If the

patient requires an urgent unexpected healthcare visit, their caregiver will have to set aside personal responsibilities to transport them, thereby adding stress to the relationship. Disease exacerbations may also prevent individuals from interacting and contributing to their community. For instance, a person neglecting to take their antidepressants or a congestive heart failure patient who is short of breath from missing a dose of their diuretic may miss work or social events, potentially impacting much of the community. Because medication adherence and community relations are interdependent, it behooves geriatric individuals to be compliant with their medication regimen.

Medication Nonadherence (MNA)

On average, 3.8 prescriptions are written annually in the United States, and roughly 20% of them are not filled. When a medication is filled, it is taken inappropriately nearly 50% of the time (Neiman et al., 2018). Medication adherence is a complex process that involves many variables, namely social determinants of health, that are dependent on each other to succeed. If one of these variables fails or is inadequate, nonadherence is more likely to occur.

MNA may be classified as intentional or unintentional. Intentional MNA involves the patient abstaining from or purposefully altering their prescribed plan. In unintentional MNA, other factors outside of the patient's control influence whether they take their medications. Examples of unintentional MNA include but are not limited to affording the medication, physically obtaining the medication, remembering to take the medication, not understanding the medication's purpose, and worrying about the usefulness of the medication (Kaur, 2019). MNA is far more commonly related to unintentional factors rather than a patient's intent to inappropriately take their prescriptions (Ng et al., 2014).

Aging Population

The Population Reference Bureau reports that, by 2060, over 98 million Americans will be 65 or older, comprising almost a quarter of the population (Mather et al., 2015). Elderly individuals are more likely to have lifelong chronic, and recurrent health conditions resulting in multiple medications being prescribed, known as polypharmacy (Shruthi et al., 2016). Currently, 89% of individuals in this population take at least one prescription medication, and approximately 54% take at least four prescription medications (Kirzinger et al., 2019). While polypharmacy may be necessary to treat a combination of conditions concurrently, it increases one's risk for MNA whether due to the regimen's complexity or a surplus of undesirable side effects. Per the PAN Foundation (2020), MNA for common chronic diseases such as hyperlipidemia, heart disease, hypertension, and diabetes mellitus results in approximately an additional 528.4 billion dollars of Medicare costs annually. This expenditure specifically refers to costs incurred due to disease exacerbations and deaths because of poorly managed prescription regimens.

Needs Assessment

MNA is an ongoing issue, and the elderly population is at a unique risk. The main goal of addressing MNA is to achieve compliance with medication-taking behaviors at least 80% of the time (Kleinsinger, 2018). Components of the Morisky Medication Adherence Scale (MMAS) and Brief Medication Questionnaire (BMQ) aided in identifying the impact of social determinants of health regarding medication compliance. The following PICOT question was used for this project: in elderly patients (≥ 65 years

old) who receive medication prescriptions, does the use of a screening tool aid in the identification of barriers to medication adherence.

Available Knowledge

In a review of current studies, little information can be found regarding generalized adherence throughout a population. Most studies addressing medication adherence focus their attention on specific diseases such as hypertension and depression (Walsh, 2019). Similarly, information regarding adherence on a national level is scarce while county, city and state level statistics are entirely unavailable.

The World Health Organization cites factors that influence adherence can be broken down into five categories: the patient, the treatment, the condition being treated, system-based issues, and socioeconomic elements (Kaur, 2019). Similarly, Yap et al. (2016) denote five factors as well including the patient, medication, physician, system-based, and *other*. These five factors are further divided into over 80 variables, demonstrating the complex nature of preventing adverse effects related to medication therapy.

National and State Data

According to the National Council on Aging (NCOA; 2023), an alarming 95% of older Americans live with at least one chronic condition. While even one long-term disease may be difficult to treat, treating multiple simultaneously is an even more daunting task. Unfortunately, 80% of America's elders have two or more chronic conditions. Not only are chronic diseases some of the leading causes of American deaths, but they also consume approximately 66% of the nation's healthcare budget and comprise 93% of Medicare expenditures (NCOA, 2023). These statistics are not surprising given

that up to 50% of individuals do not comply with treatments for their chronic conditions. Estimates suggest that over 100,000 individuals die annually specifically due to medication noncompliance (Kleinsinger, 2018). Despite chronic conditions costing the nation billions of dollars per year, only about 3% of the U.S. healthcare budget is invested in the prevention of health deterioration (NCOA, 2023). Given these statistics, America's healthcare system needs to make prophylactic identification of MNA factors a greater priority.

Regional Data

As of 2022, the population of Hattiesburg, Mississippi was 47,068, and the population of Ocean Springs, Mississippi was approximately 18,387 people (U.S. Census Bureau, n.d.). Unfortunately, medication noncompliance rates are practically nonexistent in these cities. However, data exists regarding chronic conditions in these areas. Between 2011 and 2015, Forrest County, which makes up the majority of Hattiesburg, Mississippi, reported the following chronic condition rates for its citizens: 21.4% had depressive disorders, 39% had hyperlipidemia, 35.4% had hypertension, 33.9% were obese, 9.8% had asthma, and 9.3% had type-2 diabetes mellitus. Jackson County, which encompasses Ocean Springs, Mississippi, reported the following chronic disease rates for its population during the same period: 23.4% had depressive disorders, 38.3% had hyperlipidemia, 41.6% had hypertension, 31.8% were obese, 6.9% had asthma, and 14% had type 2 diabetes mellitus. In Forrest County and Jackson County, approximately 773 per 100,000 people and 765 per 100,000, respectively, died due to cardiovascular disease of some sort (Zhang et al., n.d.a, n.d.b). Given what is known of national medication

noncompliance rates, it can be inferred that these death rates could be significantly reduced if medication adherence was reinforced and obstacles preventing it were reduced.

Synthesis of Evidence

Medication-Related Factors

In a systematic review by Yap et al. (2016), 36 studies were reviewed for medication-related factors. These factors were divided into four categories (drug, drug regimen, drug handling, and others) and subdivided further into a total of 18 factors. The most measured factor was found in the drug regimen category where 18 of the studies concluded that polypharmacy affects medication adherence. Conversely, four of the 36 studies disagreed with these findings. The cost of medications and adverse drug reactions were the second most measured variables, both having been included in seven studies. Meanwhile, the following causes of MNA were each included in one study: medication storage, lack of storage box use, regimen changes, feeling the need to reduce medication dosages, difficulty opening containers, drug interactions, poorly designed label instructions, short-term medications, and a lack of adverse reactions with missed doses.

In a study of 150 participants aged 60 and over with hypertension, Nivya et al. (2021) concluded that adherence to medications decreased from 55% to 25% when patients began to take more than two medications, confirming polypharmacy as a barrier. Complexity of regimen and increasing cost with polypharmacy were identified as contributing factors to the decrease in adherence with polypharmacy being the second highest risk factor of the study. Meanwhile, Kirzinger et al. (2019) reported that 23% of older adults found it difficult to pay for medications. Study results revealed that patients are more likely to discuss costs with their pharmacist and adverse effects with their

providers. However, when patients felt they were in poor or fair health they were more likely to discuss the burden of cost with their prescribing provider as well. These results demonstrate why an interdisciplinary approach is necessary to improve adherence.

Healthcare Provider-Related Factors

Provider-related barriers can be divided into six factors: poor communication, lack of patient involvement, lack of trust or confidence in the provider, prescriptions by a non-specialist, and dissatisfaction with the visit. A lack of medication review was also identified as both a provider and system-related factor. Out of nine studies reviewed, four agreed that poor communication was indeed a barrier to adherence while only one study agreed on the remaining six factors (Yap et al., 2016).

Patient-Related Factors

Yap et al. (2016) identified 41 patient-related factors from 42 studies categorized further into seven key groups of “mental state, physical health, demographics, past medical history, behavior, knowledge or beliefs of the patients and other factors” (p. 1094). Six studies each agree that depression and female gender increased MNA. Additionally, six studies noted poor memory was linked to an increase in MNA while three studies disagreed with these findings. Five studies agreed that beliefs about medication increased MNA with no opposing studies.

Mendorf et al. (2020) conducted a study of 230 patients with Parkinson’s disease aged 60 and older to identify the primary causes of MNA in this population. 37% of respondents reported forgetfulness as a primary contributing factor to MNA. Most respondents reporting forgetfulness admitted to missing their midday dose leading the

study to conclude that extended-release medication taken in the mornings might decrease the incidence of MNA in this group.

A small study performed by Nivya et al. (2021) on medication compliance in the geriatric population with hypertension concluded the top reason for MNA was forgetfulness. They however found that 78% of the women reported *good* compliance compared to 75% of men. 14% and 7% of women respondents reported *moderate* and *poor* compliance, respectively. 15% of men reported *moderate* compliance and *poor* compliance 10% of the time contradicting the previously mentioned systematic review.

Healthcare System-Related Factors

Yap et al. (2016) found system-related factors to include: a lack of patient education, lack of medication review, lack of follow-up, lack of medication schedule given, shorter duration of prescription, closer initiation of therapies for different conditions, and a lack of community nursing services to pack medications. Four studies concluded that lack of follow-up contributed to MNA, while two other studies reported a lack of education. The remaining factors only boasted one study each. No studies were found to disagree with the reported factors and their relationship to MNA.

Knowledge may be a systematic, patient, or physician-related factor, but for the purposes of this DNP project, it was considered a system-related issue. Mendorf et al. (2020) noted education to be a primary factor of MNA in people with Parkinson's who are 60 and over. Study participants were asked if they knew the names and dosages of their medication, the reasons for taking prescribed medications, and if they were familiar with the dosing schedule. 32.5% of respondents reported a lack of knowledge as the main factor in their MNA.

Knowledge in the face of polypharmacy proves to be a major barrier to prescription adherence. Bosch-Lenders et al. (2016) revealed an average of nine prescribed daily medications reported by 754 participants. Of these participants, only 15% knew the indications for their medication. This study noted that increased age, male gender, and living alone decreased knowledge of medications (Bosch-Lenders et al., 2016).

Rationale

Survey Tool

For this DNP project, a custom-made survey was created primarily based on the Morisky Medication Adherence Scale (MMAS) and Brief Medication Questionnaire (BMQ). Created in 2008, the eight-item MMAS was designed to assess patients' perceptions and adherence to antihypertensive treatments. However, with slight changes to verbiage, this scale may be applied to other chronic conditions while retaining its validity and reliability (Uchmanowicz et al., 2019). Similarly, the BMQ assesses medication adherence and patient perceptions, but it is more in-depth than the MMAS since it reviews each individual medication rather than just focusing on the patient's overall medication-taking behaviors (Svarstad et al., 1999). In doing so, it can better identify the specific culprits of MNA whether they are medication-specific or due to underlying SDH factors. Both the MMAS and BMQ are brief, simple, and cheap methods for assessing factors that may contribute to patients' MNA.

COM-B Model

The Capability, Opportunity, Motivation-Behavior (COM-B) Model for Behavior Change was used as a guide for this DNP project. Designed by Michie et al. (2011), this

model uses psychological theory to assess the likelihood of behavioral change. The model notes that, for a behavior to occur, one must have the capability, opportunity, and motivation to do so, and conversely, a lack of any of these factors decreases the odds of the behavior happening (Easthall & Barnett, 2017).

Capability refers to the physical and mental ability to complete the behavior (Michie et al., 2011). Regarding medication adherence, a person may not be capable of independently taking their medications if they have physical limitations such as poor dexterity or visual impairment. Similarly, a person with a psychological condition such as dementia would not have the mental capability to remember medication regimens.

Opportunity involves non-patient factors that influence the behavior's likelihood (Michie et al., 2011). Examples of opportunities include environmental considerations such as transportation and distance to the nearest pharmacy. Opportunities for medication adherence may also be affected by one's social network and culture; for instance, evidence suggests that a person with a supportive social support network is more likely to be medication adherent (Easthall & Barnett, 2017).

The third component of the COM-B model, motivation, is somewhat more complex due to its subjective nature. Motivation involves the conscious and unconscious brain processes that drive and govern one's actions. In addition to conscious decision-making, motivation includes one's emotional state, habits, and personal desires (Easthall & Barnett, 2017). While a patient may be physically capable of driving to a pharmacy, depression may render them unmotivated to do so.

While all three of the COM-B model's components can influence medication-taking behavior and vice versa, a person's capabilities and opportunities may also affect

their motivation (Michie et al., 2011). Patients who are incapable of reading medication labels may grow tired of struggling with their medications and lose motivation. Likewise, one who struggles to afford medications (poor financial opportunity) may be unmotivated to get medications if it means choosing between their health and eating. Because it focuses on both personal and external factors that influence behaviors, the COM-B Model has merit in analyzing social determinants of health and their impact on medication compliance.

Conceptual Framework

No standardized frameworks exist that identify the relationships between SDH factors and their influence on MNA. For this reason, this DNP project's researchers adapted a conceptual framework (Figure 1) that was designed by Jaam et al. (2018) based on 18 systematic reviews regarding the relationship between diabetic medication compliance and influencing factors. This adaptation removed diabetic factors and included those regarding the patient's personal characteristics, medications, healthcare providers, and the healthcare system. Multiple examples of these factors as identified by the researchers' review of evidence-based research articles have been listed under their respective categories. The adapted framework also acknowledges that medication adherence influences patient factors just as they affect it. For example, compliance with a medication regimen and alleviation of disease symptoms may alter a patient's beliefs towards taking their medications, which may in turn increase adherence.

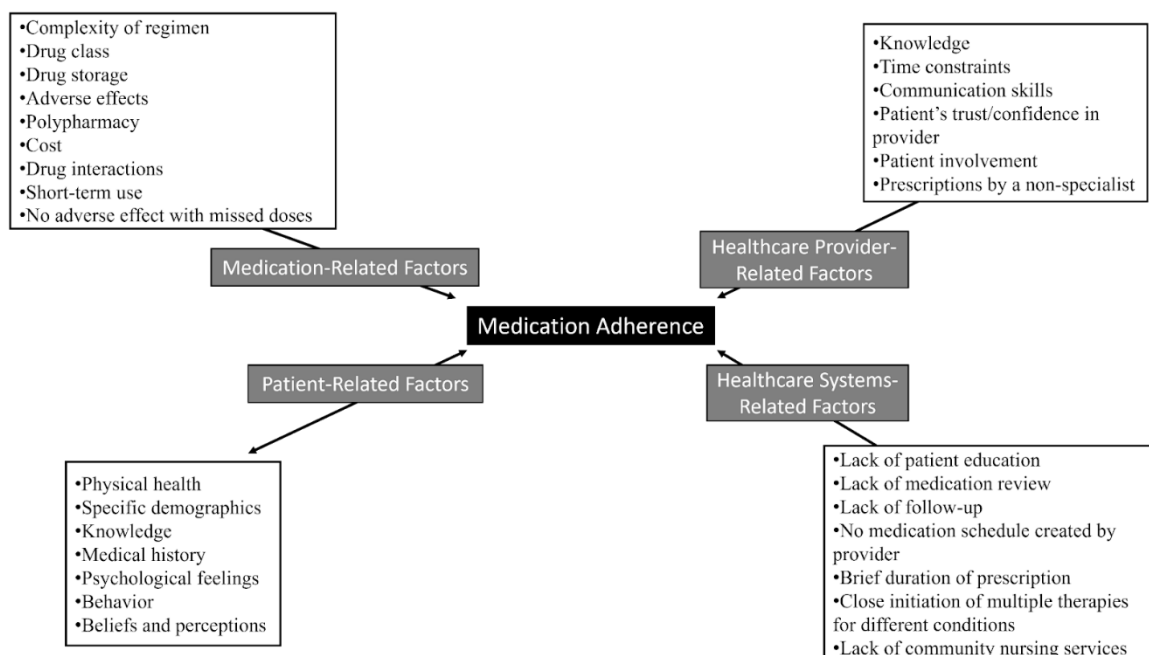


Figure 1. Conceptual Framework for Medication Adherence Factors.

Project Purpose

The primary objective of this DNP project was to identify the prevalence of patients at risk for MNA and the most common influencing barriers within a primary care clinic in Ocean Springs, Mississippi, and urgent care in Hattiesburg, Mississippi. To do so, a custom medication adherence screening tool was created based on questions from the MMAS-8 and BMQ along with two custom questions, which addressed difficulties traveling to a pharmacy to get medications and physical issues with opening medication bottles/packets. A transportation question was included due to the majority of Mississippi's population living in rural areas, making distance and transportation a potential barrier to medication compliance. A question investigating physical dexterity was added to identify if opening medication bottles/packets was a barrier because little to no information is currently available on the topic. Variables measured and analyzed included age, gender, ethnicity, number of medications taken daily, highest level of

education achieved, insurance usage, and fixed income status in addition to yes/no answers from the custom questionnaire. To incorporate the COM-B Model's three concepts of capability, opportunity, and motivation into the tool, three questions pertained to each variable. The survey's final question regarded familial or caregiver support, and as such, it included all three COM-B model factors. A key identifying the specific topics addressed in each of the survey questions may be found in Appendix B. The long-term objective of this DNP project was to inform healthcare providers of the most common hindrances to medication compliance in their local geriatric population. In doing this, researchers hoped to promote a practice change to identify and ameliorate barriers prophylactically in the clinic rather than reactively once they become an issue for the patient.

Doctor of Nursing Practice Essentials

The American Association of Colleges of Nursing's (2006) Doctor of Nursing Practice (DNP) Essentials were exhibited and incorporated into this DNP Project. The COM-B Model and a conceptual medication adherence framework were used alongside empiric research as the foundation to create a screening tool and guide this DNP project (Essentials I, III, & VIII). In this way, the screening tool was a science-based method to evaluate and improve upon current healthcare standards (Essentials I, II, & III). Specifically, it served as a useful method for data collection to expand upon current knowledge and metrics regarding MNA (Essentials II & III). Furthermore, it was also an instrument with the potential to increase patients' understanding of MNA factors influencing their lives, thereby potentially aiding patient and population health outcomes and preventing disease exacerbations (Essentials VII & VIII). Researchers electronically

analyzed data to identify barriers to medication adherence and similarities between demographics. Future improvements suggested to clinic providers included involving a digital screening tool like the one used in this DNP project (Essential IV). Dissemination of this DNP project may provide future researchers, healthcare professionals, and policymakers with the necessary information for expanding knowledge, improving practices, and creating healthcare policy regarding medication nonadherence (Essentials V, VI, & VIII). A summation of the specific ways that the DNP Essentials were incorporated into this DNP project can be found in Appendix E.

Summary

To reduce the healthcare costs and patient morbidity and mortality related to MNA, it is essential to detect and address barriers before they become problematic. Intervention is especially necessary for the geriatric population as they are at an increased risk for multiple chronic comorbidities and poor health literacy (Neiman et al., 2018). Since it causes staggeringly detrimental health and financial outcomes, MNA must be addressed if America's healthcare system is to improve. For outpatient clinic providers, screening tools such as MMAS and BMQ can be quick and simple methods for identifying and preventing patient-specific barriers to MNA before adverse events occur.

CHAPTER II – METHODS

Project Description

The purpose of this DNP project was to identify problem areas in patients' lives that may contribute to MNA. This DNP project took place in an urgent care in Hattiesburg, Mississippi, and a primary care clinic in Ocean Springs, Mississippi. As such, both facilities care for patients in the South Mississippi region. The urgent care was one of six walk-in urgent care clinics in Hattiesburg and contained six exam rooms. The primary care clinic was one of seven in Ocean Springs, and it had 19 exam rooms shared between seven providers. Both facilities accepted patients of all ages, but their preferred patient populations were adolescents and older. The inclusion criteria for this DNP project required participants to be age 65 or older and currently prescribed one or more prescription medications. If these criteria were met, the patients were then able to complete a screening tool that was created by the researchers based on questions in the MMAS and BMQ. The screening tool was implemented over the course of two weeks. After the intervention was completed, patterns between aggregates were identified, and barriers to medication compliance were analyzed.

The COM-B Model and a conceptual framework were used to guide this DNP project as they both note the interconnected relationships between social determinants of health and patients' likelihood of being compliant with a recommended behavior. The conceptual framework provided a non-exhaustive list of examples of medication, patient, healthcare provider, and healthcare system-related factors that influence medication adherence. To incorporate the COM-B Model into this DNP project, the DNP project's survey tool contained three questions for each of the model's components of capability,

opportunity, and motivation. The final question of the screening tool pertained to all three of these components.

Procedures

Pre-Intervention

The healthcare providers in Hattiesburg urgent care and the Ocean Springs primary care clinic were informed of this DNP project. They were asked to inform any patients who met the criteria about the DNP project after they checked in at the clinic. Participants were recruited with a poster describing the DNP project at the lobby's front desk. A full disclosure of the DNP project was typed and displayed on the poster next to blank surveys. At no point during this DNP project was a biological sample gathered, a physical exercise required, a physical exam or medical procedure performed, or drugs or biological products administered. The data collected for this DNP project did not include identifiable or sensitive information, nor did it utilize deception or hidden audiovisual recordings. Prisoners did not participate in this DNP project, and individuals with altered mentation were not recruited to participate. Researchers maintained confidentiality by collecting surveys in a locked container. Once this DNP project was concluded, all data was shredded.

Intervention

After reading the disclosure and purpose of the DNP project, participants received the adapted medication nonadherence risk screening tool (Appendix A). The beginning of this screening tool included one question regarding the number of medications taken daily and six demographic questions that addressed age, gender, race, highest education level achieved, whether the participant was on a fixed income, and which type (if any) of

health insurance they had. The remaining 10 questions used dichotomous variables (yes/no) to address medication compliance factors over the previous month. Of note, the categories of capability, opportunity, and motivation were addressed with three questions each, and a 10th question pertained to all three of these factors. Upon completion of the screening tool, the participant placed the paper into the slit of a locked box. Only the DNP project researchers had access to their respective clinic's locked box.

Post-Intervention

After implementing the screening tool for two weeks, the collected quantitative data was analyzed. In doing so, the researchers were able to identify the most prominent barriers to medication compliance. A distribution table was created to show the prevalence of each variable assessed, and another was made based on the COM-B Model's variables. This form of data analysis was utilized due to its simplicity and ease of use when displaying frequencies within a dataset. The results for this DNP project were distributed to each respective healthcare facility to advise providers of their patient population's most common barriers contributing to MNA. Data included the most notable findings from the research such as the screening questions with the most frequent "yes" replies, which aspect of the COM-B model (capability, opportunity, or motivation) was most commonly reported as an issue, and any correlations noted between demographic metrics and survey replies. Throughout this DNP project, no risks, costs, or inconveniences were identified for the participants. A potential benefit of participation was that patients could recognize and address factors that may encourage MNA. Costs to researchers were limited to those of the paper used to print the survey tools, the lobby posters, and the lockboxes.

Ethical Considerations

Before implementing this DNP project, Institutional Review Board approval was obtained from The University of Southern Mississippi (Protocol #: 23-0593). Consent for participation in this DNP project regarding the protection of human subjects was required. Information gathered for this DNP project included: (a) demographics, specifically age, gender, race, education level, income status, and insurance provider; (b) whether polypharmacy was a factor; (c) and whether an individual has previously demonstrated the capability, opportunity, and/or motivation to adhere to their medication regimen.

Summary

This chapter described in detail the process implemented for this DNP project. An adapted screening tool was created using the MMAS and BMQ tools. The tool was created with the intent to identify barriers to medication adherence based on factors in an elderly individual's life that may alter their capability, opportunity, or motivation to adhere to their medication regimen. Chapter III will further elaborate on this intervention by discussing the data analysis results.

CHAPTER III – RESULTS

The goal of this DNP project was to identify the most common potential barriers to medication adherence within each of the two clinic's geriatric populations. To do so, surveys were placed in the lobbies of each clinic for a total of 2 weeks from July 10th, 2023, to July 24, 2023. A total of 8 and 4 patients completed the survey at the Hattiesburg, Mississippi urgent care and Ocean Springs, Mississippi primary care clinic, respectively. In addition to demographic questions, the surveys consisted of 10 yes/no dichotomous questions pertaining to common barriers that individuals may face regarding taking medications prescribed to them. Topics addressed include issues about transportation, forgetfulness, finances, adverse medication effects, knowledge deficits, and physical deficits. Furthermore, the questions addressed issues with one's capabilities, opportunities, and/or motivations regarding medication regimen adherence. Upon receiving and analyzing this data, researchers were then able to disperse this information to their respective clinic's providers to educate them on their local populations' needs.

Hattiesburg, Mississippi Urgent Care Sample Demographics

Demographic analysis showed that participants were between 67 and 77 years old with the median age being 74. Sixty-two and half percent of the participants were female. 75% of the patients were Caucasian, and 25% were African American. Forty percent of the participants completed high school or obtained a General Educational Development (GED) certificate, 13% obtained an associate degree, 25% obtained a bachelor's degree, and 12.5% obtained a law degree. Eighty-seven and a half percent of the participants used Medicare, but only 12.5% used Medicare Part D. Fifty percent used private insurance in addition to Medicare, and 25% used Veterans Affairs insurance. Sixty-two and half

percent reported being on a fixed income, 25% were not on a fixed income, and 12.5% preferred not to answer. Participants reported taking from one to seven medications daily with a mean of 3.4 medications. These demographics are displayed in Table 1.

Ocean Springs, Mississippi Primary Care Clinic Sample Demographics

Demographic analysis showed that participants were between 66 and 87 years old with the median age being 81.5. Seventy-five percent of the participants were female. One hundred percent of the patients were White/Caucasian. Fifty percent of the participants completed a master's degree or above, and 50% held a high school diploma/GED. One hundred percent of the participants used Medicare with 75% of those also holding private insurance. Twenty-five percent used Medicare Part D in addition to Medicare. Fifty percent of participants reported being on a fixed income, and one participant preferred not to answer this question. Participants reported taking 5-13 medications daily with a mean of 9.5 medications. These demographics are displayed in Table 2.

Table 1

Hattiesburg, Mississippi Urgent Care Survey Demographics

Variable	<i>f</i>	%
Age		
65-74	5	62.5%
75-84	3	37.5%
Gender		
Male	3	37.5%
Female	5	62.5%
Ethnicity		
Caucasian	6	75%
African American	2	25%
Education		
High School/GED	4	50%
Associate's Degree	1	12.5%
Bachelor's Degree	2	25%
Law Degree	1	12.5%
Insurance		
Medicare	2	25%
Medicare + Part D + Private	1	12.5%
Medicare + Private	3	37.5%
Medicare + Veterans Affairs	1	12.5%
Veterans Affairs	1	12.5%
Fixed Income		
Yes	5	62.5%
No	2	25%
Prefer not to answer	1	12.5%

Table 2

Ocean Springs, Mississippi Primary Care Survey Demographics

Variable	<i>f</i>	%
Age		
65-74	1	25%
75-84	1	25%
85-95	2	50%
Gender		
Male	1	25%
Female	3	75%
Ethnicity		
White/Caucasian	4	100%
Education		
Master's degree or above	2	50%
High school diploma/GED	2	50%
Insurance		
Medicare only	1	25%
Medicare/ Medicare part D	1	25%
Medicare/ Private	2	50%
Fixed Income		
Yes	2	50%
Did not answer	1	25%

Analysis of the Data

Throughout the survey, responses of “yes” to any questions indicated potential barriers to medication adherence. The following information represents the combined participant data from both locations’ surveys. Question one inquired about issues

traveling to the pharmacy to obtain medications. 8.3% answered “yes” to having transportation issues. Questions two and six inquired if participants were forgetful about taking medications or bringing their medications with them while away from home. 25% answered “yes” to forgetting to take their medications at least once in the past month, and 16.7% answered “yes” to having forgotten their medications at home while they were away. Survey question three inquired if participants found it difficult to pay for medications. 16.7% answered “yes” to experiencing financial difficulties concerning obtaining medications. Questions four and five inquired if participants intentionally stopped taking or skipped a dose of their medication due to adverse effects or feeling as though they did not need the medication, respectively. 8.3% answered “yes” to missing at least one dose due to “feeling worse” when taking their medications. 16.7% answered “yes” to missing at least one dose because they felt that they did not need the medication. Question seven inquired if participants felt bothered or inconvenienced by taking their medications every day, to which 16.7% of participants answered “yes.” Question eight inquired if participants had issues opening their medication containers, and 16.7% reported physical deficits with this task. Question nine inquired if participants knew why they took each medication, and 8.3% indicated a knowledge deficit for at least one of their medications. Question 10 inquired if participants had help from others with managing and/or taking their medications, and 25% reported receiving assistance from others. The variables, frequencies, and percentages of survey responses for the Hattiesburg, Mississippi urgent care and Ocean Springs, Mississippi primary care clinics are summarized in Table 3.

Table 3

Survey Frequencies and Percentages

Variable	<i>Hattiesburg, MS Urgent Care</i>		<i>Ocean Springs, MS Primary Care</i>	
	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
Transportation Issue				
Yes	0	0%	1	25%
No	8	100%	3	75%
Forgetfulness Issue (Forgot to take medication)				
Yes	0	0%	3	75%
No	8	100%	1	25%
Financial Issue				
Yes	1	12.5%	1	25%
No	7	87.5%	3	75%
Adverse Medication Effects				
Yes	0	0%	1	25%
No	8	100%	3	75%
Knowledge Deficit (Did not feel that the medication was needed)				
Yes	1	12.5%	1	25%
No	7	87.5%	3	75%
Forgetfulness Issue (Left Medication at Home)				
Yes	0	0%	2	50%
No	8	100%	2	50%
Medication Inconveniencing				
Yes	0	0%	2	50%
No	8	100%	2	50%
Physical Deficit				
Yes	1	12.5%	1	25%
No	7	87.5%	3	75%
Knowledge Deficit (Unsure of condition medication treats)				
Yes	0	0%	1	25%
No	8	100%	3	75%
Aid from others				
Yes	1	12.5%	2	50%
No	7	87.5%	2	50%

Questions addressing issues with the participants' personal capabilities, opportunities, and motivations for taking their prescription medications were included to incorporate the COM-B Model for Behavior Change. Questions two, eight, and nine pertained to participants' capabilities to take their medications as prescribed, and 16.7% of responses to these questions received a response of "yes," indicating a potential capability deficit. Questions one, three, and six pertained to participants having the necessary opportunities in place to obtain and take their medications as prescribed. These questions received a response of "yes" 19.4% of the time, indicating inadequate opportunities for medication adherence. Questions four, five, and seven pertained to participants' motivation to take their medications as prescribed. A total of 13.9% "yes" responses to these questions indicated a lack of motivation to take medications. Question 10 inquired if participants had received assistance from others with managing their medications. While 25% of participants answered "yes," indicating a lack of capability, opportunity, and/or motivation to take their medications without continued support from others, evidence suggests a support network increases the likelihood of medication adherence (Easthall & Barnett, 2017). Overall, the survey revealed poor opportunities for taking medications properly as the most likely contributing COM-B factor for medication nonadherence. The frequencies and percentages of the COM-B model aspects for the Hattiesburg, Mississippi urgent care and Ocean Springs, Mississippi primary care clinic are summarized in Table 4.

Table 4

Capability, Opportunity, and Motivation Barrier Frequencies and Percentages

	<i>Hattiesburg, MS Urgent Care</i>		<i>Ocean Springs, MS Primary Care</i>	
<i>Variable</i>	<i>f</i>	<i>%</i>	<i>f</i>	<i>%</i>
Capability Issue				
Yes	1	4.2%	5	41.7%
No	23	95.8%	7	58.3%
Opportunity Issue				
Yes	1	4.2%	6	50%
No	23	95.8%	6	50%
Motivation Issue				
Yes	1	4.2%	4	33.3%
No	23	95.8%	8	66.7%

Summary

The purpose of this intervention was to identify specific barriers that patients may have regarding adhering to their medication regimen. A custom medication adherence screening tool (Appendix A) was created and used to record the participants' responses regarding social determinants of health in relation to medication-taking behaviors. This screening tool was adapted from questions in the MMAS and BMQ with the addition of two questions pertaining to transportation and physical dexterity issues that may negatively impact medication adherence. The tool inquired upon barriers to adhering to a medication regimen related to transportation, forgetfulness, finances, adverse medication effects, knowledge deficits, inconveniences, and physical deficits. The findings of this

DNP project suggest that forgetfulness and a lack of opportunity to obtain medications are frequent medication adherence barriers. Chapter IV will expand upon these results, note limitations to this project, and discuss implications for the future of healthcare practice and research.

CHAPTER IV – DISCUSSION

Summary

The goal of this DNP project was to identify the common barriers to medication adherence in the elderly population and demonstrate the usefulness of implementing a risk screening tool. A voluntary survey was available for two weeks at an urgent care clinic in Hattiesburg, Mississippi, and a primary care facility in Ocean Springs, Mississippi. The custom survey featured common barriers to medication adherence in conjunction with the COM-B Model for Behavioral Change to identify factors inhibiting adherence in the respective communities. The most notable components contributing to MNA included a lack of opportunities to take medications appropriately and participant forgetfulness.

Because of the small sample size, the data obtained from this DNP project did not provide statistical significance. However, the results indicated that a variety of barriers to medication adherence were present within these populations. While the information obtained from this intervention may supply providers with slight insight into their local populations' medication adherence barriers, this project ultimately showed that continued research in this area is needed on a local and state level. Only by doing so can researchers adequately identify the most impactful issues regarding Mississippians' medication-taking behaviors.

Interpretation of Results

Although the sample size for this study was limited, the results indicated a higher incidence of forgetfulness than other variables contributing to MNA, which coincided with previous studies (Nivya et al., 2021). While the sample size was 50% less in the

Ocean Springs clinic compared to the Hattiesburg clinic, an average of 9.5 medications were taken per participant, and 13 barriers were noted when compared to the Hattiesburg clinic, which averaged 3.4 medications taken and three barriers total. These findings support the connection between polypharmacy and nonadherence, which is in concurrence with results from 18 studies included in the systematic review by Yap et al. (2016). While researching medication screening tools, the authors of this paper found no other questionnaire that incorporated the use of the COM-B model when identifying barriers, indicating a need for further research into behavioral aspects of adherence.

Providers at both clinics were asked what they believe are the most common barriers to medication adherence amongst the questions asked in the custom survey. The Hattiesburg urgent care providers agreed that the most common barriers noted during patient interactions include forgetfulness, cost, and knowledge deficits. Their experiences are mostly supported by this project's results in terms of patient forgetfulness and cost issues. The Ocean Springs providers expected forgetfulness and knowledge deficit as the top barriers to adherence in their patients, again coinciding with the results of this project. While these findings show the providers may be in tune with the needs of their specific patients, these results also show a need for more interventions to prevent the known barriers. All providers were advised that an electronic medication adherence survey may prove useful after adding or changing medications for their patients.

Limitations

Limitations to this study included the implementation period, the number of participants at each location, voluntary involvement, the patient population at the Hattiesburg location, and the days and hours of operation at the Ocean Springs facility.

Data was collected for two weeks from 12 participants overall. The method of data collection poster recruitment. The Hattiesburg urgent care was open to patients approximately 74 hours per week including weekends. However, the Ocean Springs clinic was only open to patients approximately 38 hours per week and was closed on weekends. Patients at the Ocean Springs clinic were predictable since they scheduled appointments before their visit, but patients at the Hattiesburg clinic were sporadic since visits were as needed and unscheduled. Furthermore, visitors to the Hattiesburg clinic may not have been residents of the area as it is common for travelers to stop here for acute care needs. Whether participants were visiting or residents of the area, this project was limited to individuals within the geographical locations of Hattiesburg, Mississippi, and Ocean Springs, Mississippi, and the results may not be generalizable to the American public. Should this project be re-implemented, a longer collection period and distribution of screening tools to all patients at check-in might yield a larger participant group. Additionally, opening data collection to all adults over 18 may help show alternative barriers common to various communities or populations.

Conclusion

Forgetfulness was a common reason for nonadherence, demonstrating a need for reinforcements such as daily medication administration reminders and follow-up education for patients between visits. Providers should consider encouraging patients to download a free medication reminder application on their cell phones. Such applications help alert patients about taking medications and ordering prescription refills. They also allow loved ones to help manage doses, see medication interactions, and schedule

appointments (Health Network Group, LLC, 2023). Pharmacies continue to evolve their practice by incorporating medication reminders in their mobile applications.

Data is lacking concerning medication adherence barriers on local, state, and national levels. More studies are needed to identify barriers and solutions to this significant issue in the American healthcare system. Future research should also consider the addition of all adults 18 years of age and older when collecting data since MNA is not exclusively a geriatric concern. The frequency of assessing these barriers also needs to be studied as well as the availability of an electronic survey within clinics. Results regarding patient willingness and barriers should be evaluated at different times such as before the appointment and after new prescriptions are begun to assess optimal responses.

Due to the costly effects of MNA on the healthcare system and the value-based reimbursement models that the Centers for Medicare and Medicaid Services promote, it would be advisable to implement the use of a screening tool and address patients' barriers to adherence before adverse outcomes can occur. As patients of all ages may face medication adherence barriers, the addition of a screening tool such as this may be beneficial in other populations. Considering the low cost of distribution and the potential implications for increased quality of life in patients, the usefulness of screening for medication adherence barriers, especially in the geriatric population, should be evaluated by all providers.

APPENDIX A – Medication Adherence Screen Tool

Protocol #: 23-0593

MEDICATION SURVEY

Please circle or write your answer to the following questions

Age: _____ Gender: Male Female Other: _____ # of Daily Medications _____

What is your ethnic background? Please circle all that apply

White/Caucasian Black/African American Asian Native American Hispanic Other: _____

What is the highest level of education that you have completed?

Some grade school High school diploma/GED Bachelor's degree
Master's degree or above Other: _____

Which insurance do you currently have? Please circle all that apply.

Medicaid Medicare Medicare Part D Private insurance None

Are you currently on a fixed income? Yes No Prefer not to answer

In the past MONTH, have you...

1. Had trouble traveling to a pharmacy to get your medication?
Yes No
2. Forgotten to take your medications?
Yes No
3. Stopped taking (or taken less of) a medication because it was too expensive?
Yes No
4. Stopped taking (or taken less of) a medication because you felt worse when you took it?
Yes No
5. Stopped taking (or taken less of) a medication because you felt that you did not need it?
Yes No
6. Forgotten to bring your medication when you left home, causing you to miss a dose?
Yes No
7. Felt bothered or inconvenienced about taking your medication every day?
Yes No
8. Had trouble opening your medication packet or bottle?
Yes No
9. Been unsure of why you take a certain medication?
Yes No
10. Had help from a family member or caregiver with managing your medication?
Yes No

APPENDIX B – Medication Adherence Screen Tool Key

In the past month, have you...

1. Had trouble traveling to a pharmacy to get your medication? (transportation; opportunity)
2. Forgotten to take your medications? (forgetfulness; capability)
3. Stopped taking (or taken less of) a medication because it was too expensive? (financial; opportunity)
4. Stopped taking (or taken less of) a medication because you felt worse when you took it? (adverse medication effects; motivation)
5. Stopped taking (or taken less of) a medication because you felt that you did not need it? (knowledge deficit; motivation)
6. Forgotten to bring your medication when you left home, causing you to miss a dose? (forgetfulness; opportunity)
7. Felt bothered or inconvenienced about taking your medication every day? (motivation)
8. Had trouble opening your medication packet or bottle? (physical deficit; capability)
9. Been unsure of why you take a certain medication? (knowledge deficit; capability)
10. Had help from a family member or caregiver with managing your medication? (multifactorial; capability, opportunity, and motivation)

APPENDIX C – Medication Adherence Project Patient Consent Form

Protocol #: 23-0593

MEDICATION ADHERENCE PROJECT PATIENT SURVEY CONSENT FORM

I understand that I am about to participate in a survey that focuses on patients' medication-taking behaviors, which should take no more than ten minutes. I authorize the project researchers to use the information collected in my survey for their Doctor of Nursing Practice (DNP) project. I understand that the information collected from all surveys will be kept confidential, used strictly for the completion of this DNP project, and destroyed upon project completion. I understand that I will remain anonymous to the researchers throughout this survey. I acknowledge that participation is entirely voluntary, and there will be no compensation nor anticipated risks for participating in this survey. I understand that I may discontinue the survey at any point should I become uncomfortable answering the questions. **My "X" below indicates that I am a consenting participant over the age of 18 and that I agree to all of the terms and conditions of use for this survey project. If you are willing to participate, please place an "X" next to "I am 65 or older and agree to participate in this survey."**

_____ I am 65 or older and agree to participate in this survey

_____ I do not wish to participate in this survey

Date: _____

For questions, please contact the project researchers via email:

Hattiesburg: Blake Meranto, BSN, RN

Ocean Springs: Miranda Joyner, BSN, RN

Blake.Meranto@usm.edu

Miranda.Joyner@usm.edu

For concerns regarding this project, please contact USM's IRB Chair via telephone at (601) 266-5997 or via mail at 118 College Drive #5125, Hattiesburg, MS 39406-0001

APPENDIX D – Institutional Review Board Notice of Committee Action

6/30/23, 9:51 AM

IRB Chair Committee Expedited Letter - Wright[1651].htm

**Office of
Research Integrity**



118 COLLEGE DRIVE #5116 • HATTIESBURG, MS | 601.266.6756 | WWW.USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI using the Incident form available in InfoEd.
- The period of approval is twelve months. If a project will exceed twelve months, a request should be submitted to ORI using the Renewal form available in InfoEd prior to the expiration date.

PROTOCOL NUMBER: 23-0593
PROJECT TITLE: Early Identification of Barriers to Medication Adherence in the Elderly Population Through the Use of a Modified Screening Tool
SCHOOL/PROGRAM: School of Leadership & Advance Nursing Practice
RESEARCHERS: PI: Blake Meranto
Investigators: Meranto, Blake~Morgan, Lisa~Joyner, Miranda~
IRB COMMITTEE ACTION: Approved
CATEGORY: Expedited Category
PERIOD OF APPROVAL: 29-Jun-2023 to 28-Jun-2024

Lisa Wright

Lisa Wright, Ph.D., MPH
Senior Institutional Review Board Analyst

APPENDIX E – DNP Essentials

DNP Essential	Application to Project
I - Scientific Underpinnings for Practice	Evidence-based research, the COM-B Model, and a conceptual medication adherence framework were used to investigate and address MNA.
II - Organizational and Systems Leadership for Quality Improvement and Systems Thinking	An evidence-based screening tool was used to address and improve upon providers' perceptions of barriers to medication adherence.
III - Clinical Scholarship and Analytical Methods for Evidence-Based Practice	Researchers critically evaluated research to make connections between information from various disciplines and improve current standards. After implementing this project's intervention, researchers were able to contribute to collaborative research and provide recommendations for improving healthcare practices.
IV - Information Systems/Technology and Patient Care Technology for the	Researchers used health information technology to evaluate current practices

<p>Improvement and Transformation of Health Care</p>	<p>and analyze data, thereby identifying problematic aspects that could be improved. Future improvements may involve a digital screening tool like the one used in this project.</p>
<p>V - Health Care Policy for Advocacy in Health Care</p>	<p>Dissemination of this project may incite a practice change of screening all patients for medication adherence barriers at the facilities where it was implemented, if not others, thereby potentially increasing awareness of those barriers.</p>
<p>VI - Interprofessional Collaboration for Improving Patient and Population Health Outcomes</p>	<p>Dissemination of this project's screening tool and the data obtained from this project may improve current medication adherence practices in healthcare fields beyond primary care and urgent care facilities.</p>
<p>VII - Clinical Prevention and Population Health for Improving the Nation's Health</p>	<p>This project's screening tool has the potential to increase patients' understanding of MNA factors influencing their lives, prevent disease</p>

	exacerbations, and improve patient and population health outcomes.
VIII - Advanced Nursing Practice	Inquiring about a patient's unique medication adherence barriers improves the patient-provider relationship, establishes concern, and optimizes health promotion, thereby increasing the likelihood of desirable patient outcomes and patient satisfaction.

REFERENCES

- Altarum Healthcare Value Hub (AHUH). (2020). *Mississippi residents worried about high drug costs support a range of government solutions* (Data Brief No. 81).
- American Association of Colleges of Nursing (AACN). (2006). The Essentials of doctoral education for advanced nursing practice.
<https://www.aacnnursing.org/portals/42/publications/dnpessentials.pdf>
- American Association of Retired Persons (AARP). (2023). *Does Medicare cover prescription drugs?* <https://www.aarp.org/health/medicare-qa-tool/does-medicare-cover-prescription-drugs.html>
- Bandi, P., Goldmann, E., Parikh, N. S., Farsi, P., & Boden-Albala, B. (2017). Age-related differences in antihypertensive medication adherence in Hispanics: A cross-sectional community-based survey in New York City, 2011-2012. *Preventing Chronic Disease, 14*(57). doi: 10.5888/pcd14.160512.
- Bartlett Ellis, R. J., Hertz, D., Callahan, P., & Ruppert, T. M. (2020). Self-reported nonadherence associated with pharmacy and home medication management inconvenience factors in a US adult population. *Patient Preference and Adherence, 14*, 529-539. DOI: 10.2147/PPA.S223408
- Bosch-Lenders, D., Maessen, D. W., Stoffers, H. E., Knottnerus, J. A., Winkens, B., & van den Akker, M. (2016). Factors associated with appropriate knowledge of the indications for prescribed drugs among community-dwelling older patients with polypharmacy. *Age and Ageing, 45*(3), 402–408.
<https://doi.org/10.1093/ageing/afw045>

- Easthall, C., & Barnett, N. (2017). Using theory to explore the determinants of medication adherence; Moving away from a one-size-fits-all approach. *Pharmacy*, 5(3), 50. <https://doi.org/10.3390/pharmacy5030050>
- Gerlach, L., Kavanagh, J., Watkins, D., Chiang, C., Kim, H., & Kales, H. (2017). With a little help from my friends? Racial and gender differences in the role of social support in psycho later-life depression medication adherence. *International Psychogeriatrics*, 29(9), 1485-1493. doi:10.1017/S104161021700076X
- Health Network Group, LLC. (2023). *5 best pill reminder apps*. Medicare.org
- Jaam, M., Awaisu, A., Mohamed Ibrahim, M. I., & Kheir, N. (2018). A holistic conceptual framework model to describe medication adherence in and guide interventions in diabetes mellitus. *Research in Social and Administrative Pharmacy*. <http://dx.doi.org/10.1016/j.sapharm.2017.05.003>
- Kaur, R. J. (2019). Elderly and medication non-adherence. *Journal of The Indian Academy of Geriatrics*, 15(1), 3-4.
- Kirzinger, A., Neuman, T., Cubanski, J., & Brodie, M. (2019). *Data note: Prescription drugs and older adults*. KFF. <https://www.kff.org/health-reform/issue-brief/data-note-prescription-drugs-and-older-adults/>
- Kleinsinger, F. (2018). The unmet challenge of medication nonadherence. *The Permanente Journal*, 22(3), 18-033. DOI: 10.7812/TPP/18-033
- Mather, M., Jacobsen, L. A., & Pollard, K. M. (2015). *Population Bulletin*, 70(2). Population Reference Bureau.
- Mendorf, S., Witte, O. W., Grosskreutz, J., Zipprich, H. M., & Prell, T. (2020). What predicts different kinds of nonadherent behavior in elderly people with

Parkinson's disease? *Frontiers in Medicine*, 7.

<https://doi.org/10.3389/fmed.2020.00103>

Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterizing and designing behaviour change interventions.

Implementation Science, 6(1), 42-42. DOI: 10.1186/1748-5908-6-42

National Council on Aging (NCOA). (2023). *Get the facts on healthy aging*.

<https://www.ncoa.org/article/get-the-facts-on-healthy-aging>

Neiman, A. B., Ruppar, T., Ho, M., Garber, L., Weidle, P. J., Hong, Y., George, M. G., Thorpe, P. G. (2018). *CDC grand rounds: Improving medication adherence for chronic disease management - Innovations and opportunities*. Centers for Disease Control and Prevention.

Ng, J., Moon, S. K., Park, T., & Tan, W.P. (2014). Intentional and unintentional medication nonadherence – comparing older and younger adults. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 58(1), 160–164.

<https://doi.org/10.1177/1541931214581034>

Nivya, S., John, N. N., & Thomas, A. M. (2021). An introspection on the need of medication compliance in geriatric patients with hypertension. *Journal of Drug Delivery and Therapeutics*, 11(1-s), 57–61. <https://doi.org/10.22270/jddt.v11i1-s.4747>

PAN Foundation. (2020). *Issue brief no. 13: Medication adherence*.

https://www.panfoundation.org/app/uploads/2020/05/Issue-Brief-13_Medication-Adherence.pdf

- Rosenthal, L.D., & Burcham, J.R. (2021). *Pharmacotherapeutics for advanced practice nurses and physician assistants*. Elsevier.
- Shruthi, R., Jyothi, R., Pundarikaksha, H. P., Nagesh, G. N., & Tushar, T. J. (2016). A study of medication compliance in geriatric patients with chronic illnesses at a tertiary care hospital. *Journal of Clinical & Diagnostic Research*, 10(12), FC40-FC43. doi: 10.7860/JCDR/2016/21908.9088.
- Svarstad, B. L., Chewing, B. A., Sleath, B. L., & Claesson, C. (1999). The brief medication questionnaire: A tool for screening patient adherence and barriers to adherence. *Patient Education and Counseling*, 37(2), 113-124. [https://doi-org.lynx.lib.usm.edu/10.1016/S0738-3991\(98\)00107-4](https://doi.org/lynx.lib.usm.edu/10.1016/S0738-3991(98)00107-4)
- Uchmanowicz, B., Jankowska, E. A., Uchmanowicz, I., & Morisky, D. (2019). Self-reported medication adherence measured with Morisky Medication Adherence Scales and its determinants in hypertensive patients aged 60 years: A systemic review and meta-analysis. *Frontiers in Pharmacology*, 10. <https://doi.org/10.3389/fphar.2019.00168>
- U.S. Census Bureau. (n.d.). *QuickFacts: Ocean Springs city, Mississippi; Hattiesburg Cjty, Mississippi*. <https://www.census.gov/quickfacts/fact/table/oceanspringscitymississippi,hattiesburgcitymississippi/PST045222>
- Walsh, C. A., Cahir, C., Tecklenborg, S., Byrne, C., Culbertson, M. A., & Bennett, K. E. (2019). The association between medication non-adherence and adverse health outcomes in aging populations: A systematic review and meta-analysis. *British*

Journal of Clinical Pharmacology, 85(11), 2464–2478.

<https://doi.org/10.1111/bcp.14075>

Wilder, M. E., Kulie, P., Jensen, C., Levett, P., Blanchard, J., Dominguez, L. W., Portela, M., Srivastava, A., Li, Y., McCarthy, M. L. (2021). The impact of social determinants of health on medication adherence: A systematic review and meta-analysis. *Journal of General Internal Medicine*, 36(5), 1359-1370. DOI: 10.1007/s11606-020-06447-0.

Yap, A. F., Thirumoorthy, T., & Kwan, Y. H. (2016). Systematic review of the barriers affecting medication adherence in older adults. *Geriatrics & Gerontology International*, 16(10), 1093–1101. <https://doi.org/10.1111/ggi.12616>

Zhang, L., Mendy, V., Staneva, M., Teng, F., Liu, X. J., Lu, L., & Polk, A. (n.d.a) *Forrest County health profile*. Mississippi State Department of Health

Zhang, L., Mendy, V., Staneva, M., Teng, F., Liu, X. J., Lu, L., & Polk, A. (n.d.b) *Jackson County health profile*. Mississippi State Department of Health